



# BLUESKY HIGH-INTEGRITY CONNECTORS

FREUDENBERG  
FLOW TECHNOLOGIES

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INNOVATING TOGETHER

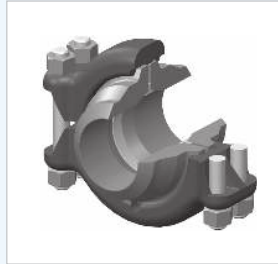
# STATIC PIPE CONNECTORS

Our reliable static pipe connectors are designed to API's & ASME's codes and standards for use in piping systems that require high integrity seals in severe service applications. Freudenberg Flow Technologies' static pipe connectors deliver outstanding performance under extreme conditions.

## BlueLock™

MODULAR  
PRODUCT

Pressure vessel nozzles and closures, process piping, compressors, pumps, manifolds, valves



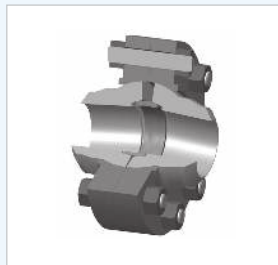
- Compact, robust design
- Highly reliable, self-energized, pressure energized, metal-to-metal seal
- Reusable high integrity seals for use in corrosive, erosive, cyclic, high pressure, high temperature applications
- Highly resistant to external loads and thermal shock (Quenching / Heating-up)
- Easy and fast assembly and disassembly

**i** Available in 1/2" through 36", up to API 15K / ASME 4500# pressure class and temperatures up to 1500°F, in a wide range of materials

## AlignLock™

MODULAR  
PRODUCT

Modular systems, manifolds, limited flexibility pipes with inevitable misalignment, skid systems, confined spaces



- Compact, lightweight design; custom configurations available
- Accommodates up to 20° of total piping misalignment
- Highly reliable, self-energized, pressure energized, metal-to-metal seal for high pressure and high temperature applications

**i** Available in 1/2" through 24", up to API 15K / ASME 4500# pressure class and temperatures up to 1500°F, in a wide range of materials

## ENGINEERING DESIGN TOOLS

Freudenberg utilizes the following in-house design tools:

- Solidworks 3-D Modeling CAD
- ANSYS Finite Element Analysis (FEA)
- In-House Research and Development Prototype Testing Facility

In addition to conventional equipment, Freudenberg has these in-house tools:

- Coordinate Measurement Machine (CMM)
- Portable Coordinate Measurement Machine
- Programmable Dot Matrix Marking Machine
- Positive Material Identification (PMI)
- Coating Thickness Gauge
- Surface Finish Gauge
- Hardness Gauge

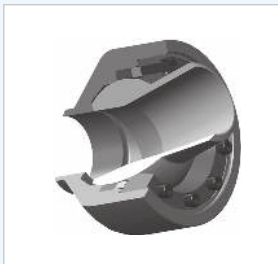
# DYNAMIC PIPE JOINTS

These innovative, high pressure, high temperature dynamic pipe joints are designed to ASME's codes and standards to reduce pipe stress and equipment loads in systems that develop high bending loads due to thermal expansion and/or differential settlement.

## FlexBall™

MODULAR  
PRODUCT

Thermal expansion and settlement in SAGD, CSS, THAI, SAP, and Coal Seam Gas Application.



- Compact, robust, lightweight design machined from solid forging
- 360° of rotational freedom and 30° total flex capability
- Chrome plated ball for superior wear and smoother performance
- Independent packing compression
- Field adjustable packing for lower maintenance costs
- Bi-directional flow

**i** Available in 1" through 24", up to ASME 2500# pressure class and temperatures up to 1500°F, in a wide range of materials

## RotaPipe™

MODULAR  
PRODUCT

Thermal expansion and settlement in SAGD, CSS, THAI, SAP, and Coal Seam Gas Application.

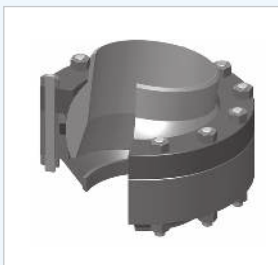


- Compact, robust, lightweight design machined from near-net forging
- 360° of rotational freedom
- Hard faced bearing surface reduces friction and wear
- High strength packing compression screws
- Independent packing compression
- Field adjustable packing for lower maintenance costs
- Bi-directional flow

**i** Available in 1" through 24", up to ASME 2500# pressure class and temperatures up to 1500°F, in a wide range of materials

## FlexBall-300™

Long-term settlement expected through the tank life; central heating plants



- Ideally suited for tank settlement
- Thermal expansion of steam piping
- 24° total flex capability
- Chrome plated ball for superior wear and smoother performance
- Latest technology in compression packing for a reliable seal and low maintenance
- Bi-directional flow

**i** Available in 8" through 24", up to ASME 300# pressure class and temperatures up to 1500°F, in a wide range of materials

# SPECIALTY PIPE FITTINGS

Freudenberg Flow Technologies offers a unique product line of specialty fittings that are designed and manufactured to exact customer specifications.

For more information on these and/or other specialty pipe fittings, please contact us toll-free at (866) 643-5999 or visit our website at [ffltech.com](http://ffltech.com)

## Wye Fittings™

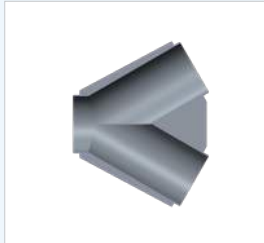
Symmetric and  
Asymmetric  
One-Directional  
Piggable Wyes

Onshore and offshore (topside & subsea) applications, pigging systems (smart & conventional), steam blowdown lines

- Integrally machined from solid forging by 5-axis CNC horizontal boring mill
- High temperature high pressure applications
- Maintains full pipe rating pressure
- Machined bores for minimal flow loss
- Design verified by code calculations and Finite Element Analysis (FEA)

**i** Available in 3" through 36", up to API 15K / ASME 4500# pressure class in a wide range of materials

Straight, Symmetrical



Straight, Asymmetrical



Radiused Port, Symmetrical



Radiused Port, Asymmetrical



## Fracturing™

Mobile nitrogen fracturing

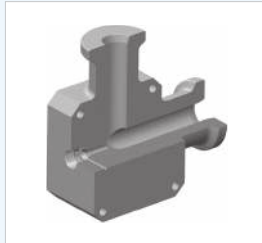
- Fittings designed for cryogenic fracturing applications
- For applications up to 15,000 psi
- BlueLock, Fig. 1502 union, and other high pressure connections available
- Custom designs available on request

**i** Available in a wide range of materials including 316SS and Nitronic 50

High Pressure Manifold



Elbow with HP Port



BlueLock x HP Adapter



Discharge Manifold



## BlueLock Thermowell™

BlueLock Thermowell  
Assembly



Critical service piping and vessel applications

- Compact, robust design
- High pressure instrumentation applications
- Uses BlueLock sealing technology
- Custom designed for specific requirements
- Available in straight, tapered, and step probe configurations
- Connecting hubs available in standard butt-weld, cylindrical radius butt-weld, and stub-end nozzles

**i** Designed and verified by in-house calculation in accordance with ASME PTC 19.3 latest edition and FEA as required; available in a wide range of materials

# INNOVATING TOGETHER

Freudenberg Flow Technologies is a global solutions provider of innovative seal solutions and differentiated seal products to the global oil and gas industry. The company is focused on the exploration and production (upstream) segment. Our associates serve a wide range of customers including oil and gas producing companies, original equipment manufacturers (OEMs) and engineering and service companies, who provide technologies, equipment and services for producing oil and gas from land-based and offshore platforms throughout the world. Freudenberg Flow Technologies has locations in Canada, Malaysia, Norway, Singapore, the UK, the United Arab Emirates, and the US.

Freudenberg designs and manufactures innovative and advanced high performance products for severe service piping applications. Our static pipe connectors, dynamic pipe joints, and specialty pipe fittings, as well as our custom engineered solutions, surpass our clients' demanding expectations. "Off-the-shelf" or custom, all our products are engineered and manufactured to withstand corrosion, erosion, and high and cyclic temperature and pressure, in accordance with the highest industry standards and within an ISO9001 certified environment.

## Modular™

Spool configurations use a combination of our modular products depending on the application needs. Products include the [BlueLock](#), [RotaPipe](#), [FlexBall](#), and [AlignLock](#). The spool configuration can be pre-assembled off-site and hydro-tested, then shipped to the field; saving the operator time and money.

High Integrity Ball Joints



High Integrity Clamp Connectors



High Integrity Compact Flanges





**UNITED STATES**

**UNITED KINGDOM**

**UNITED ARAB EMIRATES**

**CANADA**

**MALAYSIA**

**NORWAY**

**SINGAPORE**

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